

## **Wafer Integrated Rigid Support Ring**

### **Abstract**

A shadow mask for depositing solder bumps includes additional dummy holes located adjacent holes corresponding to most of the perimeter chips of the wafer. The  
5 additional dummy provide more uniform plasma etching of contacts of the wafer, improve etching of contacts of perimeter chips, and lower contact resistance of contacts of perimeter chips. The extra holes also provide solder bumps outside the perimeter chips that can be used to support a second shadow mask for deposition of an additional material, such as tin, on the reflowed solder bumps for mounting the chips on a plastic  
10 substrate at low temperature. An improved mask to wafer alignment aid is formed from standard solder bumps. The improved alignment aid avoids damage to test probes and provides improved coarse alignment.